

IOWA HIGHWAY RESEARCH BOARD

Minutes of January 26, 2001

Regular Board Members Present

J. Adam
J. George
L. Greimann
D. Julius

B. Keierleber
R. Krauel
D. Osipowicz
J. Selmer

Alternate Board Members Present

L. Brehm for W. Weiss
W. Nixon for J. Odgaard
L. Wilkinson for K. Mahoney
J. Weber for J. Witt

J. Ites
C. Schloz
B. Younie

With No Representation

T. Myers

Secretary

M. Dunn

Visitors

Saleem Baig
Dave Claman
Ed Engle
Mohammad Mujeeb
Bob Steffes
Sara Buseman
David Eash
Gordon Smith
Dean Majzoub

Iowa Department of Transportation
Iowa Department of Transportation
Iowa Department of Transportation
Iowa Department of Transportation
Iowa Department of Transportation
Iowa Department of Transportation
U.S. Geological Survey
Iowa Concrete Paving Association
Federal Highway Administration

The meeting was held at the Large Materials Conference Room at the Iowa Department of Transportation, Ames, Iowa. The meeting was called to order at 9:00 A.M. by J. Adam.

- New Board Members and Alternates in attendance, introduced themselves. John Selmer, Lee Wilkinson, Brian Keierleber, Doug Julius, Clark Schloz, and Jon Ites were at the meeting.

Approval of the Minutes

- Lowell Greimann moved and Doug Julius seconded the motion to accepted the minutes from the December 7, 2000 meeting with no additions or corrections. They were approved by the Board with 12 yes, 0 no and 0 abstaining.

Agenda Review/Modification

- The presentation of Final report TR-434, “The Use of Abrasives in Winter Maintenance”, was added.

TRB Update

- Mark Dunn read a few of the notes sent to him from DOT staff that attended TRB earlier in January in Washington DC. The information is to keep everyone posted on what is happening on a national level.
- Brian Keierleber and Doug Julius also attended TRB under an IHRB project that sends the new county engineers every year.
 - Doug Julius thanked the research board for the opportunity to attend the conference.
 - He attended many sessions on asphalt paving, due to the amount of asphalt paving in his county. He also attended sessions on Superpave, asphalt design, maintenance, and low volume roads.
 - Brian Keierleber also thanked the research board for the opportunity to attend the conference.
 - He attended many PC sessions. The Fiber reinforced concrete session was interesting. Some of the concepts were dramatically different from what we are doing in Iowa. Here we do ½ pound to 3 pounds per cubic yard in the mix and a small fiber. We can get by, by controlling shrinkage cracks with that but what their research was indicating was if we go to heavier weights of fibers (they used 12 ½ pounds in a bridge deck overlay in Canada) that they are getting structural strength out of it. They run as high as 45 pounds of fibers per cubic yard. They are using a heavier fiber while doing that.
- Dennis Osipowicz - Do we have to re-institute that research every year to keep sending the new County Engineers to TRB?
- Mark Dunn - No, we just did last year. We added another \$10,000 to it and it runs approximately \$1000 - \$1200 per person per year. So it will cover approximately 5 more years. It started as \$12,000 and was able to cover at least 6 years.

Proposal, “Handbook of Simplified Practice for Traffic Studies”

- This is a proposal in response to the first round of requests for proposals. At the last meeting it was asked that Gary Thomas scale it back some. He eliminated one of the objectives which was to use workshops to disseminate the handbook. It was discussed that it would be difficult to take it down much more and still have a quality project. The original request for proposals was close to what he had come in on initially, and the desire to have it scaled back was after that request. In order to maintain credibility and consistency, we need to stay as close to what is requested as possible. It was discussed that if a request for proposals is too high or low in terms of dollars or time, we need to discuss that and make adjustments prior to sending them out.
- The budget cost last time was \$60,000, compared to a request of \$37,400 this time. He has not only taken out the portion for the workshops, but he has taken it down from 10 to 5 boilerplates as well. He will work with the steering committee to decide which ones would be the priority ones and the most useful.
- John Adam - It sounds to me like he was responsive to the concerns mentioned at the last meeting.
- Dennis Osipowicz - I think it's where it needs to be. He had more subjects last time that weren't related to local governments, and I think that's what we were looking at.
- Randall Krauel - Do we think that 5 boiler plates will cover pretty much everything.
- Dennis Osipowicz - He listed 5 in here and they are certainly the ones that I was looking at.
- Randall Krauel - The subject matter is so wide open, used by counties and cities (so many different studies), and there is so much information, we don't want it to end up like last month's handbook and have it balloon. I'm sure he is aware of last months discussion with it going over the budget.
- Mark Dunn - With a board member or two on his steering committee, that should help not only with which ones to develop, but also if it starts ballooning, to make sure the board gives input.
- Dennis Osipowicz moved to accept this proposal, Randall Krauel seconded. Carried with 12 yes, 0 no, 0 abstaining.
- Funding is 20% Primary, 60% Secondary, and 20% Street.
- Mark Dunn will ask Tom Stoner, Tom Welch and Tom Myers if they are interested in sitting on the committee.

TR-434 Final Report, “The Use of Abrasives in Winter Maintenance”

- Wilfrid Nixon presented the final report for TR-434. The starting point for the report was to increase friction, decrease stopping distance, and maintain maneuverability of vehicles on a slippery road. Primary focus of this project was to collect information, see what has been done, see what we can say about the effectiveness of abrasives, and come up with recommendations for their use.
- The way we use abrasives right now is not effective for high volumes of traffic at high speeds. One thing that Wilfrid Nixon asked from the board, aside from approval of the report, was guidance as to if he should bring a problem statement back detailing further proposed work. It was part of the original proposal to make a suggestion as to how we might proceed if the board wants to go further.
- John Adam - I think there are 2 things that we need to consider voting on separately. First, to accept the current report and the second, weather to ask him to come back with a problem statement for future research.
- Jim George motioned to approve the report. Lyle Brehm seconded. Carried. 11 yes, 0 no, 1 abstaining (Wilfrid Nixon).
- John Adam - Any discussion on whether we should ask Wilfrid to come back with a problem statement with continued research on this?
- Doug Julius - What would be included in the problem statement?
- Wilfrid Nixon - I would propose a field trial, probably over 2 winters. Propose to purchase or build the 3 different types of novel equipment. I would have costs on all of those and a methodology on how we would do that. Design a location where we could run those tests on suitable volume roads (300 - 500 ADT). Use gravel roads that are normally treated with abrasives to see whether we can improve what’s happening.
- John Adam - Is that rock/heat concept a trademark or patent.
- Wilfrid Nixon - Their title is a trademark, but the extent to which they are patented, is unsure. What I would do is get costs on what it would be to get those units delivered. They may be willing to do it for a very low cost if they thought it would open up a market. That would be what I would bring back to you in the problem statement. If you don’t like the problem statement, the board can throw those out.
- Wilfrid Nixon - The studies from Norway and Sweden were on unpaved roads. No one, as far as I know, has looked at the effectiveness of these novel methods on paved roads. That’s not to say that we can’t do it. It is my understanding that on a paved road, you are trying to get back to the bare pavement as soon as possible and you use chemicals to do that. If you think that there are situations that this would be useful on paved roads, we can look at it. The other issue

that I was looking at was that you don't want to do a research project where you deliberately leave snow and ice on a paved road. I may come back with some stretches of gravel roads that we can use as a test bed along with some stretches of paved road where, if the weather conditions are right, we can also run the tests.

- Brian Keierleber - It's hard to believe that heating the aggregates could be economically viable. If you want to look where they do heat volume, look at your concrete plants that try to heat aggregates for producing concrete in the winter time.
- Wilfrid Nixon - Why don't I get prices on that and if I include it in there as an option you can let me know if it is an option that you want me to pursue or not. If it is not feasible, we could go ahead without that option.
- John Adam - That sounds like a good approach. Heating it to 100 - 150 is one thing, but to 400 in the winter time sounds like quite a project.
- Dennis Osipowicz motioned that a problem statement be brought to the board on this avenue of research. Brian Keierleber seconded. Carried. 11 yes, 0 no, 1 abstaining (Wilfrid Nixon).

HR-395A Final Report, "Techniques for Estimating Flood Regions and Discharges for Streams in Iowa."

- Mark Dunn - This is a result of HR-140, "Collection and Analysis of Stream Flow Data" project. We have annually supported this over time. It has recently been moved over to the SP&R fund. The project that he is going to summarize, prior to looking at this other problem statement, is one that was just recently completed, that was kind of a side project, looking at main channel slopes of rivers in Iowa, this would be an extension of that project.
- David Eash - The project is completed but the finished report is at the printers right now and I will give a brief summary of that report today and then move into the next problem statement. This is a study to update USGS regional flood peak discharge equations for Iowa. The title of the report is HR-395A, "Techniques for Estimating Flood Regions and Discharges for Streams in Iowa".
- Objectives of the project were to determine whether generally, skew coefficients should be revised for Iowa. To compile flood frequency discharges and basin characteristics for gaging stations and use four different regression methods to test which regression method would develop the best flood estimation equations. Then to develop one or two final sets of equations for Iowa. First to develop equations with the greatest predictive accuracy obtainable using which ever progression method and basic characteristics available to produce one. Second, to develop equations that are considered simple for the users to apply and also that provide the greatest predictive accuracy.
- Summary of report:
 - Skew coefficients were revised for computing flood frequency analysis for Iowa gaging stations.

- Three hydrologic regions were defined for Iowa.
 - One variable regression equations were developed for each of the 3 regions.
 - Multi-variable regression equations were developed for 2 of the regions.
 - Multi-variable equations gave about 2 - 5% greater predictive accuracy compared to the one variable equations and this is for the standard error of prediction. For the standard error of prediction there is about a 4 - 8% greater predictive accuracy. Of the 4 regression methods tested, the region regression method did provide the best flood frequency equations. The standard errors of estimates for the flood frequency regression equations developed in this study, have been lowered compared to the standard errors of estimates for regression equations developed in earlier studies for Iowa. We have been able to lower the standard errors of estimates and improve the predictive accuracy of the regression equations. To compare, the standard errors of estimates are lower for Iowa than the majority of those of neighboring states.
- John Adam - At the next meeting we should have the finished printed report to vote on at that time. Now we should proceed with the proposal.

Proposal, “Measuring Main-Channel Slopes for Major Rivers in Iowa.”

- David Eash presented the proposal. The purpose of the proposal is that there is a need to develop a simplified method for measuring main-channel slopes. This is a follow up study to the previous report just reviewed.
- If this project is accepted, a memorandum of agreement will be inserted into the flood frequency estimation reports prior to their distribution. This agreement is entered into by and between Iowa Department of Transportation and Iowa Department of Natural Resources. The agreement directs users of the flood frequency estimation report to use the one variable regression equations for hydrologic regions 2 & 3 and not the multi-variable equations, for all DOT and DNR related projects until the time that main-channel slope graphs are developed for major rivers in Iowa. If the project is accepted, the goal for the graphs to be completed is mid-year 2003.
- The objectives of the main-channel slope project:
 - To use a Geographic Information System (GIS) to measure main-channel slopes at selected intervals of major rivers in Iowa, with drainage areas greater than 100 square miles, that are located in regions 2 & 3, using 1:24,000 scale digital and topographic map data.
 - Then to plot the main-channel slope measurements by river mile.
 - Produce graphs for determining main-channel slope value between sights.
 - Compare the manual measurements of the main-channel slopes to those computed using the GIS, to determine if adjustment factors are needed for applying the GIS measurements. There are two different methods for measuring main-channel slope.
- David Eash - We’re proposing to use the GIS method in this project because it is going to be much more efficient and give us much more accurate measurements. Main-channel slope in the past was measured manually from topographic maps and they used dividers that were calibrated

at 1/10th mile intervals and they used these dividers to walk up the channels of the rivers to measure river length. These were straight lying segments to measure length, it did not include all the sinuosity of the river. The GIS method will be able to measure all the sinuosity of the rivers. We think we'll see a difference in river lengths between these two methods. The multi-variable regression equations were developed using main-channel slopes that were manually measured from topographic maps, so if we see a difference between the GIS method measurements, we may need to adjust them to make them comparable to the manual measurements that we used to develop the regression equations.

- There are approximately 148 rivers in region 2 & 3, which includes nearly 7,000 miles of river length, that drain more than 100 square miles. We propose to develop 148 graphs for the different river regions. The x-axis will be labeled with major road crossings, county lines, gaging stations and other selected points along the rivers (approximately at 5 mile intervals). This will help determine the river mile. The y-axis will give the main-channel slope value, which then can be entered into the multiple regression equations for the flood discharge estimate.
- The report/graphs for this project will be viewed as a reference manual (hard copy at this time) and the measurements will be helpful for future flood frequency studies.
- It would be a 50%-50% cost share project between the Iowa Highway Research Board and the US Geological Survey, with each funding \$107,800. The project is proposed to run just over 2 years.
- Dave Claman - To update the board, I tried to develop a memorandum of agreement to direct the use of the equations in the report for calculating the peak discharges, with the goal of people not having to pull 10 - 20 topographical maps to develop a 1085 slope for a large basin. We will probably still be using the 1085 report for anything less. We want to get the most accurate discharges as we can and make it as simple as possible to use the report too.
- Randall Krauel - How does this fit with our proposal solicitation in our business plan that we're trying to establish.
- Mark Dunn - This one was a continuation from a previous project. Because it is a result of a recommendation that came from a previous report, it came in now instead of falling into the business plan process. (It was in process prior to when the new business process started.)
- Wilfrid Nixon - I think this stems from a long standing relationship between USGS and DOT. It is hard with any of these, because there will usually be requests in finished reports (and even proposals) for further work. One of the criteria in the area of having half of our funds reserved for something like this, was if there were matching funds available. Stream flow data has come to the board several times and is now funded through a different account.
- Mark Dunn - Yes, it has been put into the annual SP&R (State Planning & Research) program so that it won't be coming back annually to this board as long as there are funds available in that area.

- John Adam - We have a problem statement before us, but we've also essentially got a proposal on the same issue, Mark could you discuss the format for how we should proceed?
- Mark Dunn - In the past we've started with a problem statement coming in and the board would vote on if there was enough interest in pursuing the research to the next step which would be a proposal. The process basically progressed into two proposals essentially. In the new process, we do all of the identification of the problem ourselves and send out the request for proposals. We end up with a proposal in front of us and only vote on it once. So that's the question with this, do we consider this a problem statement and ask him to come back later, or do we consider it a proposal and vote on it at this time?
- Randall Krauel - This is a good project and subject matter, but out of respect for the board's business plan, should we decide how we are going to handle these requests from completed research reports? If it is not time critical, should we follow the business plan that says we can list things that were not in our priority projects and at the end, prioritize those according to funding.
- Dave Claman - The USGS currently has the money for a cost share.
- Wilfrid Nixon - I think the comments are well made, but we are transitioning from the old way to the new way of doing business. There will inevitably be some special cases that we will have to deal with individually. There is a certain time sensitivity to this with the matching funds. The issue was raised that some research will spin new ideas off that need to be pursued, but at the same time, it is very useful to remind those who do the research that one project is not a guarantee of more to follow. Also, that any follow up work may have to go into the general "hopper" process and be considered that way instead of leading directly into the follow up study. Maybe another thing Mark could do is look at which projects began under the old way and are still outstanding. Then poll the researchers and ask if they are planning on having further studies coming from this. If they are, they would need to make up a problem statement now and we can prioritize it. We didn't do that at the beginning of this year, so we should have some exceptions. Like in this case, there are matching funds available.
- John Adam - It appears that there is some immediacy to this, with the matching funds, and we are in a time of transition. I don't think it would be out of place to vote on it now.
- Jim George moved to approve this proposal.
- Lyle Brehm - I question the immediacy of this. It's still two years off before we have results. Are we going to be excluding similar groups who could give us a similar proposal on the same subject.
- Wilfrid Nixon - In this case, I would say no. It is pretty clearly USGS and they have done many of these things for us before.

- Brian Keierleber - I think the idea of immediacy goes back to the funds being available from USGS.
- John Adam - Yes, three months from now, those funds may not be available for use. Right now we have a motion for the proposal to be approved. Do we have a second?
- Wilfrid Nixon seconded the motion to approve it as a proposal. Carried with 11 yes, 1 no (Lyle Brehm), and 0 abstaining.

Review of draft requests for proposals for the Second Solicitation of priority projects.

- Mark Dunn reviewed the request for proposal drafts for the second group of priority projects prioritized last year.
 - Erosion Control for Highway Applications
 - Living Snow Fence
 - Sensors and Continuous Monitoring
 - Manual for Roadside Control of Trees and Brush
 - Field Performance Study of Past Iowa Pavement Research: A Look Back
- Modifications were made and final drafts will be provided to the board for final approval.

New Business

- **Mark Dunn will prepare a financial report on the breakdown of the money for next meeting. Then have the board review last year's process.** What you liked about it, what needs improvement, and/or what we could change before we head into another round of it, if anything.
- Dennis Osipowicz - One thing that we should discuss is how we want to evaluate it if we have two proposals for the same project (like the joint seal project last time - nearly identical projects). We should have something together to deal with that.
- Wilfrid Nixon - Dave Huft of South Dakota DOT said that they put all their problem statements out as a formal RFP and they have an evaluation process. He might be able to provide some information on that.
- Mark Dunn - Initially when we were looking at the two competing proposals (for joint sealing), I asked Ian to come up with a summary as to how NCHRP handles it. Then when those fell out due to the national project and their joint work together, I never got that. I will ask him for that as well. Then we can look at the two processes and come up with something similar to one of those, or a combination. We can look at how we want to handle that with the next solicitation if we get two competing projects.

- Wilfrid Nixon - We could also use it to evaluate situations when we only get one proposal. If you have one project where you get two proposals, and they're both very good, and you have another and you're not comfortable with it, you may not want to fund it when you're struggling between the other two.
- **Next month we should also start brain storming for the next round. Each board member should start thinking of a short list of items to be thrown in as research possibilities.**
- **Mark Dunn - It was brought up that we may try to do research board meetings through the ICN. We will do a trail sometime when there isn't as full of an agenda.**
- **Doug Julius - There is a problem statement that was brought to my attention by Jon Ites.** It seems to me that it was possibly discussed in a prior meeting. The title is "Outside Wheel Path Dowel Bar Retrofit". How do we want to address this as a problem statement?
- Mark Dunn - I think that would be a good one to put in the next brain storming session when we are considering the new topics for proposal requests.

John Adam adjourned the meeting.

Date of Next Meeting

THE NEXT MEETING WILL BE HELD FEBRUARY 23, 2001 AT 9:00 A.M. IN THE LARGE MATERIALS CONFERENCE ROOM AT THE IOWA DOT.

Mark Dunn, Secretary